Date: August 15, 2002
Project Name: Puget Creek Estuary Restoration Project
Non-Federal Sponsor: Port of Seattle, Washington
Location: Lower Duwamish River, King County, Washington
Congressional District: 7
Project Completion: July, 1999
Project Cost: $200,000
Authority: Section 1135 of WRDA 1986, PL 99-662
Project Manager: Corey Loveland, 206 764-3488
Coordinated with: People for Puget Sound

Project Location:
The restoration site is in the City of Seattle in King County, Washington. The site is behind Kellogg Island (a former dredge disposal area) on the left bank of the Duwamish River, adjacent to West Marginal Way. The Duwamish River estuary extends from the mouth of the river to about river mile 14. The project was located approximately river mile two within the Seattle Harbor Project. The lower portion (about river mile 0 to river mile 7) of the river was dredged for navigation purposes during this project.

As a result of the Seattle Harbor Project, and several other non-federal projects, thousands of acres of shallow water marsh, streams and mudflat habitat in the Duwamish River estuary have been either lost or replaced with much less desirable habitat. At several sites along the Duwamish, dredged material associated with the Seattle Harbor Project was placed along the shoreline, eliminating shallow water habitat. In the mid 1800's the estuary contained an estimated 590 acres of tidal swamp, 1,170 acres of tidal marshes, and 1,450 acres of mudflats. By 1986 all of the tidal swamp was gone, and only 20 acres of tidal marshes and 25 acres of mudflats remained. Most of the land along the lower Duwamish currently is used industrially, was not for sale, and is suspect for contamination, so this site was one of the few locations that were suitable for habitat restoration.

Project Description:
This project's intent was to provide off-channel rearing and winter refuge habitat for juvenile salmon (chinook, coho, steelhead and chum). The 1135 project restored about 0.5 acres of valuable estuary habitat at a site known as the mouth of Puget Creek. The project included creation of intertidal mudflats and a tidal marsh, with an associated riparian buffer. The construction of the project involved excavation of the site to provide mud flats and gently sloping banks.

This project removed 5,000 cubic yards of material to make a 1/2 acre estuarine marsh where juvenile salmon could rear**:** 0.17 acres estuarine wetland and 0.38 acres adjacent upland. Out of the 5,000 acres of estuarine habitat that was prevalent in the Duwamish, currently less than 1% remains. The type of habitat that was constructed mimics the historic condition and provides critical habitat for the numerous fish and wildlife species that occupy the area. This site was built to only flood at higher tides – greater than 7-7.5 ft. Because of this high elevation the site is only flooded for a few hours each day and is not expected to be used extensively by juvenile salmon, but is expected to provide other estuarine functions. This site

provides important contributions of riparian detritus, invertebrates and nutrients to the estuary, important for prey and predator species, including juvenile salmon.

Project Results/Monitoring Status:
Minor monitoring has occurred. Suspected plants came in and are healthy and producing, and small juvenile salmon use the site for rearing during higher tides. There were a total of four fish sampling events (2001). No fish were captured during the March and April samplings. Juvenile Chum and juvenile Sculpin were caught during the May and June samplings. The next event is scheduled for 2003, and only vegetation will be sampled. In 2002, money became available from the Green-Duwamish Ecosystem Restoration Project for additional fish monitoring of Puget Creek. The site was monitored on ten different days and two nights in May and June of 2002. No juvenile salmon were caught but a variety of other species were including – three spine stickleback, shiner surfperch, striped surfperch, sculpins, juvenile starry flounder. Section 1135 monitoring of vegetation and channel development is planned for 2003.

This site is also monitored for bird use and vegetation development by the non-profit organization People for Puget Sound, with a project description, photos, and results of monitoring provided at their website - http://www.pugetsound.org/vshrmp/King/puget/index.html. Summaries of their monitoring efforts state, "We temporarily halted monitoring of the site in 2001 because we were concerned about the potential for monitoring activities to harm the plants. The site is densely colonized, so it's hard to move to set points without breaking branches. This was a new problem, and a result of very successful vegetation establishment. We are developing new monitoring systems for mature projects such as this, with the goal of minimizing the impact on the site. Recommendations: A stand of *Typha latifolia* (cattail) is establishing at the mouth of the march, and threatens to block access for juvenile salmonids. These specimens should be removed during the winter fish window. This site still needs a vigorous weeding at least once a year, especially around the edges where *Rubus discolor* (Himalayan blackberry) is creeping in."

The University of Washington has conducted monitoring of other estuarine restoration sites in the Duwamish and provided background on the importance of these sites for providing riparian functions. A report on monitoring results can be found at http://www.fish.washington.edu/publications, PDF No. 108.
Monitoring will be conducted in 2004 to assess use by juvenile salmon.

2001 Volunteer Salmon Habitat Monitoring Restoration Program report (Released Aug 2002):

- Download the executive summary, key findings, and action items at: http://www.pugetsound.org/vshrmp/2001_vshrmp_summary.pdf
- Download the full report (3.8 mb PDF file) at: http://www.pugetsound.org/vshrmp/2001_vshrmp_report.pdf

Excerpts from the above mentioned executive summary:

"Puget Creek shows the most dramatic improvement since last year, as can be seen both in the pictures of the site as well as on most measures of plant growth (plant height and shoot density).

Puget Creek and the western estuarine section of T105 seem to contain some natural goose-repelling qualities that should be examined more closely."